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purifying said second gas to generate a third gas; and thereafter
introducing said third gas into said reactor along with said vapor-phase chemicals
including said first gas into said reactor with sufficient supplied energy to cause a second
reaction in said reactor.

2. The process of Claim 1, wherein said reaction comprises depositing a thin film
layer on a substrate positioned in said reactor.

3. (Amended) The process of Claim 1, wherein said first gas comprises pure H₂.

4. (Amended) The process of Claim 1, wherein said second gas comprises non-
purified H₂.

5. (Amended) The process of Claim 1, wherein said third gas comprises between
about 80% to 90% of the quantity of said pure H₂ introduced in said reactor.

6. The process of Claim 1, wherein the sufficient supplied energy comprises an
RF low frequency power energy level of between about 0.318 watt/cm² to about 3.18
watts/cm².

7. The process of Claim 1, wherein said reactor comprises a tapered outer shell
surrounding a tapered susceptor.

Please add new Claims 16-28.

16. (New) The process of Claim 1, wherein said third gas comprises purified H₂.

17. (New) A process for recycling a vapor-phase chemical comprising:
introducing vapor-phase chemicals into a reactor with sufficient supplied energy to
cause a reaction for depositing a thin film layer on a substrate positioned in said reactor;
exhausting gases from said reactor resulting from said reaction;
separating a first gas from said exhausted gases;
purifying said first gas; and thereafter

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introducing said first gas into said reactor.

18. (New) The process of Claim 17, wherein said first gas comprises H₂.

19. (New) The process of Claim 17, wherein said vapor-phase chemicals comprise H₂.

20. (New) The process of Claim 19, wherein said first gas comprises between about 80% to 90% of the quantity of said H₂ introduced in said reactor.

21. (New) The process of Claim 17, wherein the sufficient supplied energy comprises an RF low frequency power energy level of between about 0.318 watt/cm² to about 3.18 watts/cm².

22. (New) The process of Claim 17, wherein said reactor comprises a tapered outer shell surrounding a tapered susceptor.

23. (New) The process of Claim 17, wherein said vapor-phase chemicals comprise gases selected from the group consisting of NH₃, N₂O, SiF₄, SiH₄, TiCl₄, N₂, Ar, HCl, and SiCl₄.

24. (New) A process for recycling a by-product of a chemical reaction comprising:

introducing vapor-phase chemicals including first use hydrogen into a reactor with sufficient supplied energy to cause a first reaction for depositing a thin film layer on a substrate positioned in said reactor;

moving said second use hydrogen through a filter to convert said second use hydrogen to processing quality hydrogen; and thereafter

introducing said processing quality hydrogen into said reactor with said vapor-phase chemicals to be used in a second reaction for depositing a thin film layer on a substrate positioned in said reactor.

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